

### Claims

1. A voltage controlled oscillator having a resonant circuit for generating a tuning frequency, the resonant circuit comprising:
  - an inductive element;
  - 5 a ferroelectric capacitor having a variable capacitance; and
  - a control line coupled to the ferroelectric capacitor for applying a control voltage to the capacitor, the control voltage varying the capacitance which, in turn, varies the tuning frequency of the resonant circuit.
- 10 2. An oscillator as claimed in claim 1, wherein the control voltage has a linear relation to the capacitance across the tuning range of the capacitor.
3. An oscillator as claimed in claim 2, wherein the resonant circuit has a relatively high loaded Q.
- 15 4. An oscillator as claimed in claim 3, wherein the resonant circuit has a loaded Q of at least 180.
5. A voltage controlled oscillator comprising a resonant circuit, the resonant  
20 circuit comprising a first ferroelectric capacitor configured to generate a variable resonant frequency.

6. An oscillator as claimed in claim 5, wherein the resonant circuit further comprises a second ferroelectric capacitor configured to facilitate frequency band-switching.

5 7. An oscillator as claimed in claim 6, wherein the first capacitor is coupled between ground and a first control voltage, and the second capacitor is coupled between the first control voltage and a second control voltage.

8. An oscillator as claimed in claim 5, and further comprising a second  
10 ferroelectric capacitor positioned in a feedback path of the oscillator to control the amplitude and/or phase of a feedback signal.

9. An oscillator as claimed in claim 8, wherein a first control voltage is applied to both the first and second ferroelectric capacitors.

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10. A voltage controlled oscillator comprising:  
a resonant circuit having a first variable ferroelectric capacitor to generate a signal having a variable resonant frequency;  
an amplifier coupled to the resonant circuit to amplify the signal; and  
20 a feedback loop coupled between the amplifier and the resonant circuit and comprising a second ferroelectric capacitor to control the amplitude and phase of a feedback signal.

11. A voltage controlled oscillator as claimed in claim 10, wherein a first control voltage is coupled to the first and second ferroelectric capacitors.

12. A band-switchable oscillator resonant circuit comprising first and second ferroelectric capacitors and first and second control voltage lines.

13. A resonant circuit as claimed in claim 12, wherein the first control voltage line is coupled to the first and second ferroelectric capacitors, and wherein the second control voltage line is coupled to the second ferroelectric capacitor.

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14. A method for band switching in a voltage controlled oscillator comprising:  
providing first and second ferroelectric capacitors;

applying first and second control voltages to the first and second capacitors so that either the first capacitor or the second capacitor dominates the output frequency of the oscillator.

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15. A method as claimed in claim 14, wherein the first control voltage is coupled to both the first and second capacitors, and wherein the second control voltage is coupled to only the second capacitor.

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16. A method as claimed in claim 15, wherein the first control voltage and the second control voltage are approximately the same, causing the voltage across the second

capacitor to be effectively zero and causing the first capacitor to dominate the output frequency.

17. A method as claimed in claim 15, wherein the first control voltage is  
5 grounded and the second control voltage is not grounded, causing the voltage across the first capacitor to be effectively zero and causing the second capacitor to dominate the output frequency.